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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/SR/CSR-05/046c/CEMENT/2016-17

Date: 25.05.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32
*NAME OF THE WORK	:	Improvements to roads and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
*REFERENCE	:	EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	23.05.2016
PERIOD OF TESTING	:	23.05.2016 to 25.05.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	28.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	165Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	485 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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Proceed for 25/5

****

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T-2377

Job No.: CTCE/BBMP/SR/CSR-05/046c/SAND-Gradation/2016-17 : 25.05.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
* Agency	: **Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
* Name of Work	: Improvements to roads and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
*Reference	: EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
Technical Reference	: IS : 2386 Part 1 - 1963 RA-2007
Sample ID	: Fine Aggregates
Sample Received on	: 23.05.2016
Date of Testing	: 25.05.2016

Total Wt. of Aggregates in gms 1000

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	93.40	90-100	90-100	90-100	95-100
2.36	78.60	60-95	75-100	85-100	95-100
1.18	61.10	30-70	55-90	75-100	90-100
600 Micron	31.50	15-34	35-59	60-79	80-100
300 Micron	18.30	5-20	8-30	12-40	15-50
150 Micron	8.70	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

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Remarks : This sample is under Zone-I specific limits.

Pradeep AE

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Job No.: CTCE/BBMP/SR/WMM/Gradation/2016-17

27.05.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.

Agency : **Mr. Sambhashivareddy,**
No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.

Name of Work : Improvements to road and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.

Reference : EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016

Date of Testing : 27.05.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **8470**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	285	285	3.4	96.6	95-100
22.4	2689	2974	35.1	64.9	60-80
11.2	1356	4330	51.1	48.9	40-60
4.75	1156	5486	64.8	35.2	25-40
2.36	956	6442	76.1	23.9	15-30
0.600	930	7372	87.0	13.0	8-22
0.075	898	8270	97.6	2.4	0-8

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Job No.: CTCE/BBMP/SR/WMM/AIV/2016-17

27.05.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP,
Agency	**Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
Name of the Work	Improvements to roads and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Reference	EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	27.05.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	376	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	78	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	355	360	
4	Aggregate Impact value = percent fines	21.47	20.74	
	100* (W_2/W_1)%			21.11

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/SR/WMM/S-T/2016-17

27.05.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
Name of Work	Improvements to roads and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Reference	EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	27.05.2016

Result : Flakiness Index = **11.96%**

Elongation Index = **13.45%**

Result : Combined Flakiness & Elongation index **25.41%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/SR/SDBC/Bitumen/2016-17

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

05.06.2016

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
NAME OF THE WORK	Improvements to road and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
REFERENCE	EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
SAMPLE I/D	Road and drains in SFS 407 in Ward No. 03
DATE OF TESTING	05.06.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	5.10	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.56	6.85	6.85	93.15	90-100
4.75	206.23	43.42	50.27	49.73	35-51
2.36	65.12	13.71	63.98	36.02	24-39
1.18	41.23	8.68	72.66	27.34	15-30
0.3	46.35	9.76	82.42	17.58	9-19
0.075	55.87	11.76	94.18	5.82	3-8

Pradeep AE

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.23	6.45	6.45	93.55	90-100
4.75	255.96	51.19	57.64	42.36	35-51
2.36	51.23	10.25	67.88	32.12	24-39
1.18	45.78	9.16	77.04	22.96	15-30
0.3	32.52	6.50	83.54	16.46	9-19
0.075	69.85	13.97	97.51	2.49	3-8

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Job No.: CTCE/BBMP/SR/SDBC/AIV/2016-17

05.06.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
Name of the Work	Improvements to road and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Reference	EE(YNKD)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	05.06.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	305	
4	Aggregate Impact value = percent fines	22.31	21.56	
	$100^* (W_2/W_1)\%$			21.93

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/SR/SDBC/Shape_T/2016-17

: 05.06.20

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	: **Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
Name of Work	: Improvements to road and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Reference	: EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 05.06.2016

Result : Flakiness Index = **12.23%**

Elongation Index = **13.56%**

Result : Combined Flakiness & Elongation index **25.79%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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05.06.2016

Job No.: CTCE/BBMP/SR/SDBC/Stripping/2016-17

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
Name of the work	Improvements to road and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Reference	EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	05.06.2016

Type of binder : 80/100

Percentage of binder used : 5.0% by wt.

Total weight of aggregate : 200 g

Total weight of binder : 10.0 g

Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.0	2.76	97.24
2	2.1		
3	3.2		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/SR/SDBC/Sp_Wa/2016-17

05.06.201

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. Sambhashivareddy,** No. 14, 6th C cross , Gopalappa Layout, Manorayanapalya, Bangalore-32.
Name of the Work	Improvements to road and drains in SFS 407 in Ward No. 03 of Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Reference	EE(YNK.D)E-PMT-3/W.O/216/2016-17 Dated :11.05.2016
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	05.06.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2001	2005	2007	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1246	1250	1252	
4	Weight of saturated surface dry aggregate in air	W_3 g	2013	2015	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	767	765	768	
6	Weight of oven dried aggregate	W_4 g	2003	2004	2007	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.611	2.620	2.613	2.615
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.646	2.658	2.658	2.654
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.55%	0.65%	0.57%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2%

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